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Improving Indonesian cinnamon (*c. burmannii* (Nees & t. nees) Blume) value chains for Greater Farmers Incomes

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Abstract. Genus *Cinnamomum* (*Lauraceae*) regroups some species whose stem bark are harvested, conditioned and traded as cinnamon in an international market. Over the centuries, the species have been domesticated so that now at least six different ones are grown in Southeast Asia countries. One of the species is *Cinnamomum burmannii*, also known as Korintje Cinnamon, which generates income for most smallholder farmers in Kerinci district, Jambi, Indonesia. Most cinnamon consumed in the world originates from this Korintje Cinnamon products. It is recognized for its unparalleled quality that comes with its sharp and sweet flavor, with a slightly bitter edge. However, international market requirements for product certification and quality standards make it difficult for a farmer to comply. Our research will address issues related to (improvement of) productivity, sustainability and value chains faced by cinnamon producers in Kerinci, to strengthen their product's value chains. Smallholder farmers are very vulnerable to climate change impacts, and thus empowering the value chains of agricultural products will increase farmers resilience to climate change. The research will analyze the development of agricultural value chains, certification & standards on trade mechanism to help farmers earn a better income and future prospects.

1. Introduction

Indonesia is a tropical country crossed by the equator. It has the second largest biodiversity and the third largest natural resource reserves for oil, natural gas, gold, copper and other minerals in the world. The country is also rich in various types of ecosystems: aquatic ecosystems, freshwater ecosystems, tropical rainforests, peat swamps, mangroves, coral reefs and coastal ecosystems. The highest biodiversity in Indonesia is to be found in the tropical forest environment. Not only serving as a source of commercial and industrial wood products, it also provides people's daily necessities, such as lumber, pulp, and paper. However, Indonesia is now facing multiple problems such as illegal logging, chaotic urbanization, unsustainable agriculture, and forest conversion (converting forests into large-scale plantations). As a result, Indonesia faces the great challenge of combining poverty alleviation and economic growth with sustainable use and conservation of biodiversity. For this reason, Indonesia needs to find solutions for the long-term sustainable use of biodiversity that will improve the social welfare of local communities.

Indonesia has several native natural products that have a potential value in local and global markets, such as *Cinnamomum burmannii* Nees ex Blume. This is one of the four types of cinnamon categorized as high economic value cinnamon besides *Cinnamomum verum*, *Cinnamomum cassia* (*C. aromaticum*, also called Chinese cinnamon), and *Cinnamomum loureiroi* (also known as Vietnamese or Saigon cinnamon) [1]. Genus *Cinnamomum* (*Lauraceae*) regroups some species whose stem bark



are harvested, conditioned and traded as cinnamon. It is categorized as spice products in an international market [2]. In addition, during the harvesting process, other commodities can also be obtained from a cinnamon tree, i.e., stem, leaves, root, and twigs, because these parts also contain beneficial constituents [3]. Cinnamon is considered as a high-value plant because every part of the plant, besides functioning as a spice, can also be used for pharmaceutical and perfume [4]. Cinnamon wood can be used as raw materials for particle board, while the leaves and branches can be distilled to obtain oil. Over the centuries, the species have been domesticated so that now at least six different ones are grown in Southeast Asia. One of the native cinnamon species in Indonesia is *Cinnamomum burmannii*, also known as Korintje Cinnamon, which generates income for most small growers in Kerinci district, Jambi, Indonesia. The largest cinnamon plantation is situated in West Sumatra in the region known as Kerinci, near the city of Padang. This native plant is a prime commodity, especially in West Sumatra and Kerinci regency, as the center of cinnamon production in Indonesia. Most of the cinnamon consumed worldwide is the Korintje Cinnamon products. It is recognized for its unrivaled quality that comes with its sharp and sweet flavor, with a slightly bitter edge.

Although cinnamon bark belongs to one of the Indonesia's export commodities, the prices obtained by farmers for its transactions are still low. Thus, this small income affects the revenue of cinnamon farmers and their families. Basically, the price of cinnamon received by farmers adapted to the type of cinnamon bark. However, international market demands of product certification and quality standards make it difficult for small growers to meet the request. The international consumer protection agency requires safe products that are free from chemical elements harmful to human health. It causes the exporters to be careful in providing quality commodities, as well as requiring farmers to conduct the cultivation process based on the operational standards.

Another factor is related to the gate prices received by small growers for the transactions that are still low. Besides, the price of the cinnamon in a producer level does not correlate with the export corporation rate [5]. Although cinnamon is not a primary revenue for the producer, its function is critical as a reserve fund for the farmers to meet the needs of their daily life. Most cinnamon small growers have a small area of land that decreases the number of crops. One cinnamon tree can produce approximately 20 - 25 kg of cinnamon. Korintje Cinnamon, one of the highest cinnamons consumed worldwide has a trouble in this value chain scheme. Small growers must wait for the harvesting time for up to 15 years. This long wait will certainly affect the total revenue of the farmers, causing them to have a low-income and lead to poverty. There should be particular efforts such as product derivation and diversification to create its added value. Accordingly, this research is aimed at finding the variables that can improve the welfare of cinnamon farmers.

2. Methods

The research was conducted in Talang Kemuning Village, Bukit Kermai Subdistrict, Jambi Province, Indonesia in February 2017. The object of this study were the relevant stakeholders, including small growers, cooperative initiatives, cinnamon collectors, local government and the other trading channels of Korintje cinnamon. The place for collecting the sample was chosen purposely by selecting the location where the producer and buyer work closely together in the concept of sustainable agriculture. The sample farmer population is a farmer who produces and sells cinnamon. A 10% sample is taken from each of the heads of households in Talang Kemuning Village. Collecting samples and other trading agents involved in the value chain channel using the purposive sampling method, which is traced to the producer to end market.

The research has addressed some of the issues on value chains improvement faced by cinnamon producers in Talang Kemuning village. The community lives in Bukit Kerman sub-district. It is located in the district of Kerinci, Jambi, Indonesia. Having an area of 1,600 Ha, there are totally 1,200 people living in this community, spreading in 520 families. The majority of people's livelihoods are farmers because the area has enough land to produce agricultural products such as cinnamon, coffee, and cocoa.

There are two types of data in this research, namely primary and secondary data. The primary data were collected through in-depth interviews with key informants. From this type of data, the researcher obtained the information of general economic actors, economic potentials, marketing channels, production and trading costs, and the purchase price and selling price. The secondary data were garnered by recording the related institutions or Non-Governmental Organizations (NGOs) and searching from the relevant sources of literature.

Based on a field study at Talang Kemuning in February 2017, the yields of cinnamon accounted for 10% of the total fixed revenue of a small cinnamon grower, where the other 90% is obtained from other crops. This little contribution of cinnamon income is caused by its low price and extended harvest period.

3. Result and Discussion

Nearly 90% of small growers in Talang Kemuning, Kerinci have the other sources of income to support their livelihoods. They work as a labor in a rubber plantation, housemaids in Malaysia, and many other types of hard work. The findings showed that there are two major constraints identified, namely on-farm and off-farm problems.

3.1. On-Farm Issues in Kerinci

Based on the value chain stream, in the first phase, there is a source of bark obtained by small growers that are lacking competence and knowledge on agricultural practices. It has been proven that they are the only clearcutting without replanting new trees. Small growers also use traditional tools to cultivate the bark from the cinnamon tree. Then, the second constraint deals with the ownership of land, most of 1 Ha wide (birding) are rented. The yearly production of cinnamon bark is increasingly high because of the external factors, such as seeding, fertilizers and labor cost. Due to this concern, the third constraints appear, there is a lack of industry to support products and research development in Kerinci. Furthermore, there is also a lack of investment in tree rejuvenation, replanting and further development of technologies for processing plant into essential oils and oleoresin either from government or buyers (business). The most important constraint is the lack of infrastructure to support cinnamon transportation from plantation to warehouse. Small growers used only water buffalo to carry their raw bark, from plantation to drying of the bark location.

3.2. Off-Farm Issues in Kerinci

Constraints in post-harvest cinnamon process arise because of regulations, standards, laws and also informal rules & norms that are not supporting the value chains improvement. Jambi provincial government should issue a policy stating that cinnamon should not be sold as raw materials (bark) but it should be processed through the cinnamon grinding mill to improve its value so that it can be sold both in local and international markets. Jambi provincial government can set and enforce rules to initiate and finance a grinding machine that can make cinnamon powder, essential oils, and oleoresin that has a higher sale value in the market. Another constraint is related to the direct supply chain. Because of the absence of harbor facility in Jambi, the product should be delivered to another city takes another process of trading. The last constraint in the off-farm issues deals with the international standards for agriculture practices that are difficult for small growers to comply. All of those issues eventually ended up in small growers as price takers on the basic gate-price of the cinnamon market.

Even though the income earned from cinnamon plays an important role for small growers, but the primary concern of cinnamon farmers deals with a long period of harvest time. One cinnamon tree produces about 20 kg of bark with the range of age up to 20 years for production with a variant of quality and price. Cinnamon tree is cultivated three times for its bark. The first harvest occurred when the tree reaches the age of 6 years, and the second harvest is at ten years and the last harvest time is at 15 years old. During that harvest time, the farmers are looking for other solutions to generate income, such as intercropping and planting another product that is more productive [6]. Therefore, it is important to find a solution for the farmers to produce derivative products and create a product

diversification that can give added value and improve the value chains for greater income. There are four types of upgrading [7]:

- Process improvement, where the transforming production process will reorganize or improve processing technology;
- Product development, where natural products will develop into diverse and more sophisticated product lines, with higher values per unit volume;
- Functional improvement, which refers to cases where new and superior functions will draw up in the value chains;
- Inter-sectoral upgrading, which occurs when new research or technology enables a product to shift from one sector to a different “new area.”

The involvement of other parties to improve the value chains for greater farmer income is also important in the outcome, such as described below:

Business, producer associations, universities, NGO's and local government through policy support;
Establishment of research and development (R&D) capabilities of national or regional universities, or R&D facilities of large firms with whom partnerships will form;
Strategic use of labeling, branding, trademarks, and certification.

Majority of small growers in developing countries, including those who are in Korintje area, are facing series of constraints that often limit their ability to participate competitively in a value chain improvement model including supporting functions. The following are the model of four major constraints that limit the competitiveness of small and medium-sized manufacturers and their entry into value chains [8]:

- Access to end-market
- Access to skills and capacity improvement
- Collaboration and cooperative building
- Access to finance and incentives

First, access to the end-market is relevant to improve value chains for smallholders. In the context of this model, it refers specifically to the presence of value chain connections between small growers and buyers and how they can be established. It is also important for the consumer to be informed about the origin of the products using traceability tools and sustainable measurements. In this case, neither the small-grower organic or chemical pesticide can reduce the climate change impacts. Second, while smallholders work at the farm from their childhood, a specific training is often required to improve the productivity and product quality. Such training can include the introduction of new technologies and plant varieties, not only explaining how to comply with food safety and other certification requirements but also how the value chains works [8]. Nevertheless, there are also new agricultural practice adaptations including new cutting that impact on biodiversity loss and land-slide.

Third, building coordination and collaboration at two coordination levels that can trigger R&D and infrastructure improvement by any condition. Finally, the last part is an access to finance that can support for product diversification and technology investment including more environmentally friendly agricultural machinery.

To enhance cinnamon value chains for greater farmer income, it can be conducted on several models such as educating farmers about the sustainable practices for the environment, helping them to access local and international markets, supporting their productivity improvement, promoting good agricultural practices, providing organic fertilizer, and so forth. However, it also important for the farmers to increase their knowledge about the regulation standard so they can access EU market. Below are the issues dealing with the quality and standard affecting the performance of cinnamon export value chains according to the interview conducted with Cassia Coop and VECO.

- Marketing: Understanding about EU markets due to complying with food safety standards.
- Production and processing: Poor of the application on good agricultural practices and lack of traceability system in the supply chain.

- Technology and training: Poor of R&D work in value addition, new technologies, and mechanization (traditional cultivating), applied agricultural training programs for farmers by NGO's.

Branding the Korintje Cinnamon products by putting trademarks of traceability and certification can have a significant role in the future of Indonesia's spices export markets. Putting labels, marks and food safety certifications can influence the customers to pay more for the product that is certified and meet the standard regulations and categorized as a premium product. Consumers in Europe are increasingly interested in consuming a product that has a 'clean & green' label because they are aware of the health and security of the product that will be consumed. When the products have claimed for its sustainability and traceability campaign, it is crucial to ensure that those claims can be traced. It requires a system of traceability to be implemented in Korintje Cinnamon products. However, if the cinnamon farmers in Kerinci can achieve the demanding quality standards, they surely can get more benefit and gain brighter future prospects. Therefore, for the purpose of livelihoods improvement, the farmers should choose and decide whether or not a particular set of standards is good for their cinnamon through-out sustainability objectives.

4. Conclusion

Implementing several models to improve the farming system and marketing is associated with enhancing farmers' knowledge on the standard regulation to access EU market so that it can benefit cinnamon farmers in Kerinci in the future. Improving the cinnamon commodity is still prospective in Kerinci. However, farmer's traditional ways of cultivating cinnamon cause them to receive less income than the actual price. Therefore, farmers are expected to decide the standard of Korintje Cinnamon products in order to improve their income and livelihoods.

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